

PROPOSAL AMENDMENT

SUMMARY

Agriculture is vital for attaining broad-based economic growth for meeting the global development objectives of alleviating poverty and hunger and improving nutrition, health, and social wellbeing in Zambia. The majority of the poor live in rural areas where over 75% of the population depend on smallholder farming for subsistence and livelihoods. About 85% of the smallholder farmers cultivate maize as a primary staple crop under rain-fed systems. It is estimated that over 55% of the daily caloric intake in Zambia is derived from maize with the average consumption of about 85-140 kg per person per year. Eighty percent of maize in Zambia is produced by smallholder farmers under low soil fertility, frequent drought, and limited use of high yielding varieties, improved agronomic practices and inorganic fertilizer. The smallholder production systems are also characterized by undeveloped markets for agricultural products and weak extension services and technology delivery systems. As a result, average maize yields in Zambia (1.5 t/ha) are amongst the lowest in the world. Despite the national surplus, several smallholder farmers across the country and especially the resource poor farmers and women who lack capital and assets to invest in improved production methods are deficit producers and net buyers of maize. This SIMLEZA-AR project aims at leveraging science for sustainable productivity growth, intensification and diversification of maize-based systems in the region through new varieties, improved agronomic practices (including conservation agriculture), legumes integration, and improved access to markets and services.

The SIMLEZA-AR project adopts participatory and value chain approaches and aims at increasing food security and productivity, in the context of climate risk and change, through the development of more resilient, profitable and sustainable maize-legume farming systems and institutional innovations that improve farmers' access to technologies, inputs and markets. Gender mainstreaming, monitoring and evaluation will be cross-cutting activities. Improved maize and legume varieties and value chains innovations will be tested through on-farm research, demonstrations and pilot interventions in input and produce marketing chains.

The five main objectives under the SIMLEZA-AR project are: (a) to enhance technology targeting and delivery for the poor male and women farmers by identifying systemic constraints and options for improving input and output value chains and impact pathways; (b) to identify productive and resilient agronomic practices for intensification and income growth in maize-legume cropping systems; (c) to enhance the diversification of maize based diets through promoting processing of soybean at household level; d) to increase the range of maize and legume varieties through participatory screening, testing and release, and enhanced delivery of seeds of adapted varieties; (e) to enhance the capacity of national partners in technology generation, deployment and service delivery for the poor. The project targets the Eastern Province of Zambia as the Zone of Influence by USAID, and works mainly in Chipata, Katete, and Lundazi Districts. The project is expected to scale out technologies to directly benefit at least 20,000 farm households by 2015.

JUSTIFICATION

In 2013, CIMMYT and IITA formulated joint activities under Africa Research in Sustainable Intensification for the Next Generation (Africa RISING), building on and continuing ongoing work in the context of the USAID Feed the Future (FtF) project Sustainable Intensification of Maize-Legume Systems for the Eastern Province of Zambia (SIMLEZA). An adjustment of the work plan for the combined SIMLEZA–Africa RISING activities for 2014/15 was done in Chipata in August 2014. This work plan was aligned to the recently formulated log frame of the Africa RISING programme. The program will focus on validation of improved agronomic practices, drought tolerant maize and legume varieties, soya processing, as well as scale up and delivery these technologies to farming households. The planned activities for 2014/15 are congruent with research outputs 2 and 3 (integrated systems improvement and scaling up and delivery respectively of the Africa RISING log frame.

The project has identified a number of scalable technologies, which can be classified into four three main categories: (1) CA-based intensification options that can fit different farm types (2) soya agronomy and utilization related technologies, as well as (3) new drought tolerant maize and soybean varieties. During the planning meeting the project identified several knowledge gaps that needs to be further addressed before full scale up of the identified technologies can be effectively be happening. For instance, trade-offs, cost-benefits and risk analyses still need to be carried out on validated technologies, while the drivers of already adopted technologies (such as herbicide use) still needs to be understood better, in order to assess their value as entry points for the extension of other SIMLEZA-AR technologies. In addition, the adoptability of specific (combinations of) technologies by different types of farming households requires better understanding. Hence, a number of additional research activities have been formulated to address these shortcomings in our understanding of scalability of proven technologies. Some of these are prioritized in the 2014/15 work plan (listed below).

ADMINISTRATIVE DETAILS

Project Title:	Sustainable Intensification of maize-legume Systems in Eastern Province of Zambia – Africa RISING (SIMLEZA-AR)
Grant Agency:	Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) - East and Southern Africa Project-IITA
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Country:	Zambia
Principal Investigator:	Dr. Peter Setimela Senior Scientist
Implementing Partners: National Agricultural Research System, Universities and other Research Organizations	CIMMYT, ZARI, GART, IITA, IFPRI, WUR, MSU
Development Partners:	TLC
Period of activity:	October 2014 to September 2016
Amount requested:	350,000 USD for the whole project amendment

Name	Gender	Institution	Job title	Disciplinary expertise	Degree	Project role/responsibility	% time commitment
Peter S. Setimela	M	CIMMYT	Senior Scientist	Seed system specialist	PhD	Project coordinator and seed systems	20%
Christian Thierfelder	M	CIMMYT	Senior Scientist	Cropping Systems Agronomist	PhD	Lead the cropping system research	20%
Walter Mupangwa	M	CIMMYT	Associate Scientist	Cropping Systems Agronomist	PhD	Designing the cropping system and agronomy research	40%
Jens Andersson	M	CIMMYT	Senior Scientist	Innovation System Scientist	PhD	Research on innovation systems	10%
Munyaradzi Mutenje	F	CIMMYT	Associate Scientist	Socio Economist	PhD	Enhancing technology targeting delivery	10%
Julius Manda	M	IITA	Associate Professional Officer	Agricultural Economist	MSc	Socioeconomic analysis and impact evaluation	100%
Arega Alene	M	IITA	Scientist	Agricultural Economist	PhD	Socioeconomic analysis and impact evaluation	10%
Hesham Agrama	M	IITA	Scientist	Soybean Breeder	PhD	Develop high-yielding and stress-tolerant soybean and cowpea varieties	10%
David Chikoye	M	IITA	Scientist	Agronomist	PhD	Design the cropping system/agronomy and seed system (legume component)	100%
Mateete Bekunda	M	IITA	AR Chief Scientist	Soil scientist	PhD	Overall supervision of AR funded activities	5%
Jeroen Groot	M	WUR	Assistant Professor	Farming systems	PhD	Lead farming systems analysis	10%

OUTSCALING STRATEGY 2014-2016

The SIMLEZA-Africa RISING program has tested and promoted technologies from 2011-2014 with the help of partners. SIMLEZA- Africa RISING focus was on testing maize-legume system and improved agronomic practices including conservation agriculture (CA). The extensive research program led to the identification of promising and scalable technologies that can be taken up by farmers from 2014-2016 onwards. These technologies include:

- The use of herbicides for weed control
- Improved seeding technologies under CA
- Rotation systems of maize with legumes
- Intercropping of maize with legumes
- The use of inoculum for soybean planting
- Improved legume germplasm specifically soybean
- Drought-tolerant maize varieties that have been released
- Cowpea varieties

In an attempt to get some of these technologies out to the farmers as quickly as possible the program will implement modifications to the original research for development program:

- a) In target communities, where traditionally CA systems and legume agronomy options were tested on each eight validation trial locations, the number will be reduced to four trial sites.

- The remaining trials will serve as researcher-managed managed reference points for farmers (“mothers”) and will be used for demonstration, for field days and as learning centres;
- b) Freed-up resources will be used to design outscaling plots (“babies”), where successfully tested technology options will be taken up by farmers. Four technology options will be tested by CIMMYT in the babies in 2014/2015, namely: herbicide use; intercropping, rotation systems, improved drought-tolerant maize cultivars. IITA will continue extending soybean varieties through small seed packs. The mother and baby approach will potentially reach 840 farmers with babies and 3000 farmers with small legume seed packs in 2014/2015 with room to expand afterwards.
 - c) The SIMLEZA-Africa RISING project team will be engaging with other outscaling partners funded by USAID, such as COMACO, Profit Plus etc. to increase the outreach of improved technologies to smallholder farmers.
 - d) Beside the USAID funded partners the project will interact with small to medium seed enterprises to develop seed road maps to ensure that enough quantities of breeder and foundation seed is produced in preparation for the production of certified seed. Each seed company will identify a variety for scaling, produce certain quantities of seed until the target production will be reached. The seed road map will also include promotional activities such as small seed packs, variety demonstrations to ensure that farmers are knowledgeable about drought tolerant varieties to increase the uptake of the DT varieties.

Outscaling of technologies will be matched with a continued pipeline of new technologies such as new legume and maize germplasm that will be released in 2015 as well as new agronomy options that will then be ready for outscaling. The increase in seed produced by private seed companies will ensure that enough improved and certified seed will be available for the farmers to access new technologies.

DESCRIPTION OF WORK PACKAGES

Work package 1.

Work package number	WP 1	Start date or starting event:			October 2014 to September 2016
Work package title	To enhance technology targeting and delivery for the poor by identifying systemic constraints and options for improving input and output value chains and impact pathways				
Activity Type	Identifying key biophysical and socio-economic constraints that limit crop production at farm level				
Target areas (Districts- Villages)	Katete	Chipata	Lundazi		
WP leader	CIMMYT/IITA				
Partners	GART	MAL		ZARI, IFPRI, WU	
WP budget (USD)	CIMMYT: 47,000 IITA: 30,000 WUR: 50,000 (farming systems and trade-off analysis)				

Relevant Africa RISING Research Output: 1. Situation Analysis (Biophysical characterization)
Key intervention areas: Socio-economic and geo-spatial characterization of selected maize-legume farming areas and selection of research sites/communities
<p>Description of work</p> <p>SIMLEZA and AR activities 2014/16</p> <p><i>Output 8: Innovations that address emerging agricultural production challenges deployed</i></p> <p><i>Output 9: Scaling approaches for targeted integrated innovations identified and piloted</i></p> <p>S1.1 (ARO 8,9) S1.1 Maize-legume value chains</p> <p>S1.2 (ARO 8,9) Economic analysis of on farm experiments</p> <p>S1.3 (ARO 8,9) Adoption monitoring</p> <p>S1.4 (ARO 8,9) Early adoption & impact analyses</p> <p>S1.5 (ARO 2) Farm typology based analyses</p> <p>S1.5.1 (ARO 8,9) Risk analyses for different technologies per farm type</p> <p>S1.5.2 (ARO 8,9) Trade off analyses for different technologies, per farm type</p> <p>S1.6 (ARO....) Fulfill joint M and E requirements (IFPRI)</p> <ul style="list-style-type: none"> Maize-legume value chains A value chains approach will be adopted to promote and sustain the adoption of improved technologies through increased output marketing and demand creation for maize and legumes. After a market survey of processors, traders, and other actors along the maize-legume value chains in Eastern province, strategic alliances that will link producers to traders and processors will be established. Value chains development will involve activities that lead to increased farm gate prices for producers as well as lower prices and diversify uses maize and legumes for consumers Economic analysis of on-farm trials Gross margin, stochastic dominance and risk analysis will be conducted using on-farm trial data to provide a guide on the relative profitability and importance of various cropping systems. Data will be collected using specially designed data sheets to capture agronomic data as well costs of input and outputs. This will provide a guide on which treatments merit further investigation and on the recommendations to make to farmers with regards to the

most profitable cropping system.

- **Monitoring adoption of maize-legume technologies in the project areas and beyond**

An adoption monitoring study will be conducted to assess the number of farmers who are aware of SIMLEZA technologies and who are adopting technologies promoted by SIMLEZA, major sources of technology information, technologies preferred by farmers and the major constraints to adoption of technologies/practices. The survey will specifically target farmers who are aware of SIMLEZA technologies, including farmers who are hosting SIMLEZA demonstrations and trials.

- **Early adoption and impact studies**

Early adoption and impact studies will be conducted to assess the extent, pathways, and determinants of technology adoption as well as the farm level or primary impacts of technologies among adopters in the target sites where there is significant early adoption. Research hypotheses will be formulated to test and explain gender differentials in adoption and impacts with a view to enhancing the intra-household distribution of the benefits from the project.

- **Farming systems analysis**

The farming systems analysis will work around the following framework, with specific activities highlighted in the grey boxed (Figure 1). In summary, the process starts with a rapid farming system characterization exercise allowing the development of functional farm typologies, and a detailed characterization farming system description, allowing complete farming system diagnosis. This information would then be synthesized and analyzed toward the exploration of system innovations and system redesign.

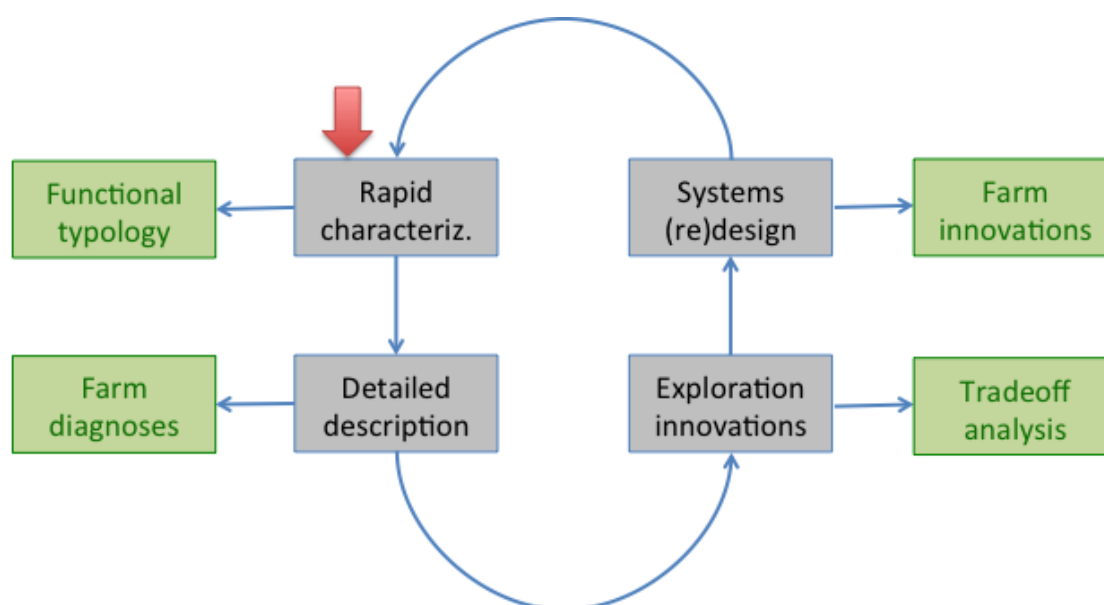


Figure 1: Proposed components of the farming system analysis and entry point identification strategy. Phases in the analysis represented by grey boxes, products indicated in green boxes. Starting point of the analysis indicated with the red arrow.

Step 1. The **rapid characterization** will build on the previously conducted RALS survey. Additional information of households to be collected would focus in particular on:

- Labour availability and use for crop and animal production activities.

- Animal management and feeding.
- Manure management and use.
- Organic inputs such as (purchased) feeds and other resources for instance from roadsides and common areas.

A first appraisal will be made of the farm components present (soil, crops, livestock, etc.), to arrive at first model-based estimates of nutrient flows, labour use, profitability and efficiencies. Such information will allow the construction of functional typologies, e.g., more directly related to production objectives.

Step 2. A sub-set of the households engaged in the rapid characterization activity will be identified for detailed characterization of their farm and livelihood status. More detailed data on actual production levels, costs and prices will result in accurate **diagnosis** of resource flows and socio-economic performance. Such information will allow the diagnosis of the main factors driving the generation of outputs at farm level.

Step 3. A model-based **exploration** of alternative farm configurations will be made for each selected farm. Based on current inputs and production activities (cropping, animals, manure use, etc.) and potential innovative practices, a set of alternatives will be generated using a multi-objectives optimization technique. This will provide insight into tradeoffs and synergies among farm objectives, and will inform discussions with farmers and other stakeholders towards selection and implementation of an improved farm set-up.

Step 4. The **redesign** is based on the set of alternatives generated the previous step and discussions with farmers and stakeholders. The most promising alternative in terms of productivity, profitability and efficiency will be selected. This represents a new farm set-up that needs to be further fine-tuned for implementation on farms of the same the functional type (see II.2). The performance of the new farm set-up will be monitored and new cycles of diagnosis – exploration – redesign can be conducted to reach an adaptive farm improvement.

Deliverables 2014/16

- Report: Maize-legume value chain opportunities and constraints
- Report: Adoption and impact studies
- Database established on the uptake and impact pathways of maize-legume technologies
- Report: Farm typologies per district
- Report: Risk profiles per farm type
- Report: Technology tradeoffs per farm type

Work package 2.

Work package number	WP 2	Start date or starting event:			November 2014 to September 2016	
Work package title	Enhance adoption and adaptation of productive and resilient agronomic practices and facilitation of local innovation systems for intensification and income growth in maize-legume cropping systems					
Activity Type	Action research type, R&T, participatory and promotional action					
Target areas (Districts-Villages)	Katete	Chipata	Lundazi			
WP leader	CIMMYT and IITA					
Partners	TLC and MAL	WUR		ZARI		
WP budget (USD)	CIMMYT: 106,000 IITA: 25,000					

Relevant Africa RISING Research Output: 2. Integrated systems improvement

Key intervention areas:

Establishment of on-farm and on-station research addressing critical production constraints and sustainable intensification needs for smallholder farmers in maize-legume cropping systems

Description of work

SIMLEZA+AR activities 2014/16

Output 4: R4D and Innovation platforms influencing stakeholder practices established

Output 9: Scaling approaches for targeted integrated innovations identified and piloted

S2.1 (ARO 4, 9) Conduct discussions with farmers/innovation platform partners to identify agronomic and seed technologies to be tested on-farm in each of the targeted communities

S2.1.1 (ARO 4, 9) Continue platform meetings with stakeholders in Lundazi and explore opportunities to support and strengthen (new) platforms in Katete and Chipata

S2.1.2 (ARO 4, 9) Information flow between actors of the innovation system (including farmers) encouraged and facilitated

S2.1.3 (ARO 4, 9) Setting up systematic feedback loops with farmers and document outcomes

Output 5: Innovations that increase resilience and productivity of farming systems deployed

Output 6: Crop-nutrition and water efficient innovations introduced, evaluated and adapted

S2.2 (ARO 5, 6) Establish on-farm validation trials of maize-legume rotations and integrated innovations to identify improved germplasm and conservation agriculture technologies that increase productivity and incomes from maize-legume system.

S2.2.1 (ARO 5, 6) Conduct pre-season meeting for farmers, extension officers, CACs at camp level

S2.2.2 (ARO 5, 6) Establish out-scaling plots on proven technologies on at least 840 farmers' fields

S2.2.3 (ARO 5, 6) Conduct on-farm CA and double legume trials

S2.2.5 (ARO 5, 6) Conduct on-farm soybean agronomy trials on inoculation and fertilizer combinations

S2.2.6 (ARO 5, 6) Conduct qualitative evaluation of on-farm agronomic technologies trials by farmers and other IP stakeholders (early, mid and end of season)

Output 3: Potential impact of various SI technologies in different development stages assessed

S2.3 (ARO 3, 5, 6) Evaluate crop production technologies (varieties, agronomic practices) for

adaptation and adoption in the targeted agro-ecologies

S2.3.1 (ARO 3, 5, 6) Conduct on-station CA trials - long term CA, and double legume trials

S2.3.2 (ARO 3, 5, 6) Conduct on-station component trials on Soybean agronomy –inoculation, plant population trials

Output 9: Scaling approaches for targeted integrated innovations identified and piloted

S2.4.1 (ARO 9) Conduct field days

S2.4.2 (ARO9) Involve radio-stations and televisions in the field tours

S2.4.3 (ARO9) Develop the SIMLEZA-AR bulletin 2015

Description of work 2014/16

- The project will continue facilitating the establishment multi-stakeholder interaction mechanisms (innovation platforms) that (1) serve as a feedback mechanism in participatory (on-farm) technology development and adaptation (2.1 and 2.3), and (2) bring together and strengthen interaction between key stakeholders in technology delivery and market functioning (2.4). Work that was successfully started in Lundazi will be amplified in Katete and Chipata, building on previous work done in these geographical areas.
- The work on CA maize-legume systems in seven target community will be continued on at least four farmers' fields in each community. Based on the demand from USAID-Zambia, a set of scalable technologies will be identified and out scaled in target communities. These technologies are: 1) herbicide use; 2) rotation; 3) intercropping; 4) maize varieties. These out scaling plots of each 100m² will be deployed around the agronomic trials in form of a mother-and-baby trial design. Soybean trials will be continued as in previous seasons. The CA validations and legume agronomy trials will be set up in the November-December 2014 period. They will be monitored and data collected by Extension Agents during the 2014/2015 cropping season. During the season farmers from each target community will qualitatively evaluate the performance of each technology showcased on the research sites at three growth stages of the maize and legume crops. Farmers and extension officers will be trained through hands-on training on how to do basic agronomy operations, how to apply inoculum on legumes, how to control weeds with herbicides, how to operate different machinery, and how to harvest trials at scientific standards. Farmers without scaling plots will be routinely monitored and involved in the technology discussions.
- Some of the long-term trials at Msekera Research Station will be continued on account of their strategic importance. Due to budget constraints mainly from the USAID-Zambia mission we will however discontinue trials on weed control and residue levels. Soybean and cowpea agronomy trials will be continued at Msekera station evaluating different options of fertilization, inoculation and combinations of both. A long-term trial on CA will be continued and the effects of minimum soil disturbance, residue retention and crop rotations on water- and nutrient-use-efficiency analyzed.
- The newly introduced double-up legume systems will be continued making use of results from the Malawi AR team. The difference between the two approaches is that SIMLEZA-AR will test these species combination both under CA and conventional agriculture. The trials will be continued at Msekera station three on-farm sites

Deliverables 2014/16

- Report: Innovation platform facilitation reports per district
- Training report from camp extension officers
- Documentation of progress on secondary farmers' fields

- Report on number of trials established and findings from the on-farm trials
- Report on the 3 qualitative evaluation of technologies (early, mid and end of season)
- field days organized (target is at least 500 farmers mobilized on average for field days per camp)
- Outscaling plots on proven technologies established in 840 farmers' fields
- Study tours conducted, February 09-13 2015
- At least one peer-reviewed paper from the agronomic trials
- 1 success story per district plus each 3 success stories from CIMMYT and IITA
- 3 Radio program and newspaper articles produced
- SIMLEZA-AR bulletin 2015 (summary of success stories from SIMLEZA-AR)

Work package 3.

Work package number	WP 3	Start date or starting event:	November 2014 to September 2016			
Work package title	Enhance the diversification of soybean use at household level through processing and product development					
Activity Type	Action research, capacity building for farmers and extension staff					
Target areas (Districts- Villages)	Katete	Chipata	Lundazi			
WP leader	IITA					
Partners	GART	UNZA		ZARI		
WP budget (USD)	IITA: 8000					

Relevant Africa RISING Research Output: 2. Integrated system improvement

Promote household level technologies for processing, utilization and consumption of soybean food products.

Description of work**SIMLEZA+AR activities 2014/16****Output 7: Innovations that increase availability and consumption of safe and nutritious food products deployed**

- S3.1 (ARO 7, 9) Train camp extension officers and nutrition group leaders
- S3.2 (ARO 7) Conduct consumer acceptability/preference of products
- S3.3 (ARO 7) Conduct nutrition education and cooking demonstrations in target groups
- S3.4 (ARO 7) Conduct household follow up visits
- S3.5 (ARO 7) Evaluate nutrient content of traditional products mixed with soy flour
- S3.6 (ARO 7, 9) Reproduce/develop IEC materials
- S3.7 (ARO 7) Finalize nutrient database development for data analysis
- S3.8 (ARO 7) Conduct feasibility of introducing soy cow for soy milk production

Description of work, 2014/16

- Processing using low-cost machinery and processes for producing high quality nutritious food products under rural conditions will be tested using participatory approaches.
- Nutrition awareness campaigns will be carried out in partnership with all stakeholders involved in technology transfer activities in the project. This will involve demonstrations of food products during farmer field days or community level food fairs. The mass media will be used to transfer simplified information on the nutritional benefits of soybean based diets. Women groups and women opinion leaders will be involved in the overall process.

Deliverables 2014/16

- At least 224 trained in 7 camps
- Consumer acceptability of at least 3 products
- At least 150 group trainings and demonstrations
- At least 2 visits conducted per household
- At least 5 products evaluated

- IEC materials available
- Report on diet diversity and nutrient intakes

Work package 4.

Work package 4:						
Work package number	WP 4	Start date or starting event:		November 2014 to September 2016		
Work package title	Increase the range of maize and legume varieties through participatory testing and release, and enhanced delivery of seeds of locally adapted varieties					
Activity Type	Action research, capacity building for farmers and extension staff					
Target areas (Districts- Villages)	Katete	Chipata	Lundazi			
WP leader	CIMMYT/IITA					
Partners	GART	MAL		ZARI		
WP budget (USD)	CIMMYT: 50,000 IITA: 20,000					

Relevant Africa RISING Research Output: 2. Integrated system improvement

Key intervention areas: Introduce and evaluate improved maize and grain legume varieties to smallholder farmers to improve productivity and food security

Description of work

SIMLEZA+AR activities 2014/16

Output 5: Innovations that increase resilience and productivity of farming systems deployed

S4.1 (ARO 5) Conduct on farm and on-station trials to identify stress tolerant and higher yielding maize and legume varieties through farmer- and seed company-participatory evaluation and GXE analysis

S4.2 (ARO 5) Provide varietal performance data to accelerate variety release and registration

Output 9: Scaling approaches for targeted integrated innovations identified and piloted

S4.4 (ARO 9) Develop maize and legumes seed road maps to enhance the availability of maize and legume seeds and integrate into the work plans of public and private sector partners

S4.5 (ARO 9) Increase production and availability of breeder and pre-basic seed of farmer and market preferred maize and legume varieties to stimulate the market and community based seed production and supply

S4.6 (ARO 9) Facilitate the establishment of functional community based seed production and develop collaborative partnerships with seed companies to increase the supply and diffusion of certified hybrid maize, soybean and cowpea varieties to resource poor farmers and women

S4.7 (ARO 9) Monitoring and evaluation and reporting

Description of work, 2014/16

- **Maize On-farm trials:** The mother baby trial approach will be used for on-farm evaluation of drought tolerant maize varieties. The objectives of the trials will be to evaluate the performance and farmer preferences of new maize varieties under “real” farmer conditions, and create an understandable, cost-effective and simple flow of information between researchers, extension staff and farmers, thus integrating both technical and social aspects in the sense that the users/ultimate beneficiaries are part of the development and transfer of the technology. A total of 16 varieties composed of new drought tolerant and company varieties will be evaluated. Data will be recorded on variety performance and farmer preferences.
- **Legume on-farm trials:** Beside maize varieties legume varieties will also be evaluated on-farm using the mother baby trial approach. These will be undertaken widely through partnerships with several NGO’s, extension and farmer groups in target areas. Data will be collected on adaptation and farmer preferences.
- **On-station trials:** A number of maize and legume on-station trials will be conducted in multi-locations. The objective of the trials will be to identify well adapted varieties from other breeding programs. Only stable and high yielding varieties will be selected for further evaluation on-farm in the following season. Important agronomic traits such yield, maturity, disease and plant height will be recorded from each trial.
- **Variety Release:** Seed of new maize varieties can only be disseminated to farmers if the varieties meet formal country-specific varietal release requirements and have shown to be adapted to the local conditions. Promising varieties that have shown to perform well on-station and on-farm will be submitted to Seed Control and Certification Institute for registration. SCCI will further evaluate the varieties in multi-location trials and also to determine if the varieties are Distinct Uniform and Stable (DUS). Hence, agreements for the rights to release different DT varieties will be made with different private seed companies/producers (directly or through NARS).
- **Seed Road Maps:** This project will use strategic incentives to engage a wide range of seed companies and producers in self-sustained multiplication, promotion and dissemination of new DT maize varieties, core to reaching farmers through two main channels: (i) from seed companies to retail outlets to farmers, and (ii) from seed companies to NGO and GO-assisted seed production and dissemination programs to farmers. Seed production and promotional targets will be agreed upon with seed companies and the project. Seed companies and producers will invest in elite c maize varieties from the project, provided they have confidence the varieties are adapted and high-performing in a reasonably sized target environment or market.
- **Breeders and Foundation Seed:** The project will support seed companies and community based seed producers with initial quantities of breeders and foundation seed of newly released varieties to allow rapid scaling-up. Sufficient breeder seed of new DT maize varieties (or their parental lines) will be produced, and technical backstopping will be provided for rapid initiation of certified seed production of new DT varieties.
- **Monitoring and evaluation:** The project will continue to provide technical backstopping to seed companies, extension and NGOs to implement various activities.

Deliverables, 2014/16

- At least four drought tolerant maize varieties identified and registered.
- At least four new legume species identified
- Number of on-farm and on-station trials established
- 60 variety demonstrations established in 7 communities.
- One field day involving all stakeholders held in each community
- Regional Maize Trials established at Msekera, GART and Mt. Makulu
- Advance Maize Variety Trials established at Msekera Kabwe, GART and Mt. Makulu
- 2 Advanced trials with 20 varieties established under conservation Agriculture and conventional tillage
- Quantities of breeder and foundation seed produced.
- Advance Maize Variety Trials distributed to Msekera and GART
- Seed road seed maps for maize, cowpea and soybean developed with seed companies
- 60 farmers multiplying soya and 10 farmers multiplying cowpea in each site. (45 Soybean, 15 cowpeas)

Work package 5.

Work package number	WP 5	Start date or starting event:	November 2014 to September 2016			
Work package title	Enhance the capacity of national partners on targeting, technology adaptation, trial management, seed and input supply and value chain development					
Activity Type						
Target areas (Districts- Villages)	Katete	Chipata	Lundazi			
WP leader	CIMMYT/IITA					
Partners	UNZA					
WP budget (USD)	CIMMYT: 7,000 US IITA: 7,000					

Relevant Africa RISING Research Output 3. Scaling and delivery

Key intervention areas:

1. Capacity building for graduate students from the University of Zambia
2. Short term training of extension staff and other partners

Description of work

SIMLEZA+AR activities 2014/16

Output

S5.1 (ARO 5) Pre-season training of Extension Officers and community volunteers

S5.2 (ARO 5) In-season training of Extension officers

S5.3 (ARO 8) Long-term training of students

Description of work, 2014/16

- **Two students will focus their work on legume agronomy. One will focus his studies on “Genotype by Environment Interaction and Stability for Seed Quality in Soybean (*Glycine max* L. Merrill)”. The second on “Genotype x Environment interaction and stability analysis for yield and its components in soybean [*Glycine max*.L.Merril]”**

Deliverables, 2014/16

- Report on pre-season trainings conducted and number of extension officers and community volunteers trained
- Report on in-season trainings conducted and number of extension officers and community volunteers trained
- 1 student continues

BUDGET SUMMARY

Work packages	CIMMYT	IITA	WUR	Grand Total
WP 1	47,000	30,000	50,000	127,000
WP 2	106,000	25,000	0	131,000
WP 3	0	8,000	0	8,000
WP 4	50,000	20,000	0	70,000
WP 5	7,000	7,000	0	14,000
TOTAL	210,000	90,000	50,000	350,000

CALENDAR ACTIVITIES

Progress indicators (Objectively verifiable indicators - OVI)	14- Nov	14-Dec	15-Jan	15-Feb	15-Mar	15-Apr	15-May	15-Jun	15-Jul	15-Aug	15-Sep	15-Oct
2.1 Operational farm typologies identified in the target districts of eastern Province of Zambia by September 2015												
2.2 Risk analyses for different technologies per farm type identified by September 2015												
2.3 Evaluate crop production technologies (varieties, agronomic practices) for adaptation and adoption in the targeted agro-ecologies by September 2015												
2.4 Economic analysis of on-farm experiments identified												
3.2 End line survey (adoption and early impact evaluation) conducted by September 2016												
3.3 Trade off analyses for different technologies, per farm type identified												
4.1 At least 1 R4D Innovation Platform constituted in all 3 districts of target areas by September 2015 by DACO, CIMMYT, IITA, KIT, ZAR												
4.2 Setting up systematic feedback loops with farmers												

and document outcomes by September 2015												
5.1 On-farm validation trials of maize-legume rotations and integrated innovations established to identify improved germplasm and CA agriculture technologies until September 2016, CIMMYT and TLC												
5.2 On-farm CA and double legume trials established in 3 target districts in November 2014 and 2015 with final analysis results ready by September 2016 - CIMMYT and IIAT												
5.3 On-farm qualitative evaluation of agronomic technologies trials by farmers and other IP stakeholders conducted throughout the 2014/15 and 2015/16 and synthesized by September 2016-CIMMYT												
5.4 On-station component trials on soybean agronomy, weed management, inoculation, plant population trials conducted throughout the 2014/15 and 2015/16 and synthesized by September 2016 by IITA												
5.5 Conduct on-farm soybean agronomy trials on inoculation and fertilizer combinations												

throughout 2014/15 and 2015/16 with a final results ready by September 2016												
5.6 Conduct on farm and on-station trials to identify stress tolerant and higher yielding maize and legume varieties through farmer- and seed company-participatory evaluation and GXE analysis by September 2016-CIMMYT and IITA												
5.7 60 pigeon pea demonstration plots established in 7 communities in 2014 and 2015 by IITA												
5.8 Participatory variety evaluation in the field conducted by farmers in each community as well as by seed companies in seven communities throughout 2015 and 2016- CIMMYT												
6.4 Varietal performance data to accelerate variety release and registration provided to SCCI by September 2015 and 2016												
7.1 Consumer acceptability/preference of soy bean products developed by September 2015 by IITA												
7.2 Nutrition education and cooking demonstrations in target groups conducted by September 2015 by IITA												

7.3 Evaluate nutrient content of traditional products mixed with soy flour												
7.4 Feasibility studies of introducing soy cow for soy milk production introduced by September 2016												
9.1 Field days and study tour conducted by September 2015 and 2016												
9.2 Mobilization of farmers using the channels of mass communication (radio, video, TV etc.) and field days to create public awareness of available technologies and help farmers adopt them successfully by September 2016												
9.3 Develop success stories from each district to document the progress, developments and successes in the project by June 2015 and 2016												
9.4 Annual evaluation and planning meeting conducted in August 2015 and 2016												
9.5 At least one field day organized in each community to create awareness on new maize, and pigeon pea and bring stakeholders together by March 2015 and 2016												

9.6 Identified proven technology components on CA and improved legume agronomy outscaled through "mother-and-baby" extension approaches using the old trials as mothers and small and simplified technology package plots as babies in 2014/15 and 2015/16												
9.7 Maize and legumes seed road maps to enhance the availability of maize and legume seeds and integrate into the work plans of public and private sector partners developed by September 2016												
9.8 Increase production and availability of breeder and pre-basic seed of farmer and market preferred maize and legume varieties to stimulate the market and community based seed production and supply												
9.9 Functional community based seed production and develop collaborative partnerships with seed companies facilitated by IITA by September 2016												

LOGFRAME

ESA Master Logframe Component	Objectively Verifiable indicators	Means/Source of Verification	Important Assumptions
Research Output 1: Research Output: 1. Situation Analysis (Biophysical characterization)			
Output 1: Intervention sites identified at an appropriate level, and characterized.	1. By January 2011 interventions districts identified (Katete, Chipata and Lundanzi) in the eastern province of Zambia.	Spatial maps with recommendation domains for Eastern Province project sites produced	Relevant data will be made available from different sources upon request
Output 2: Farm households characterized and typologies in intervention sites determined	2.1 Operational farm typologies identified in the target districts of Eastern Province of Zambia by September 2015	Farm typology reports generated by WUR	
	2.2 Risk analyses for different technologies per farm type identified by September 2015	Risk analyses report produced by CIMMYT, IITA and WUR available 2015	
	2.3 Evaluate crop production technologies (varieties, agronomic practices) for adaptation and adoption in the targeted agro-ecologies by September 2015	Adoption report made available by September 2016 by CIMMYT and IITA	
	2.4 Economic analysis of on-farm experiments identified	Report on economic analysis of the various on-farm technologies made available by August 2016 by CIMMYT and IITA	
Output 3: Potential impact of various SI technologies in different development stages assessed	3.1 Conduct household survey on uptake and impact pathways of maize-legume technologies by September 2016	Database established on the uptake and impact pathways of maize-legume technologies by October 15 by CIMMYT and IITA	Relevant data will be made available from different sources upon request

	3.2 End line survey (adoption and early impact evaluation) conducted by September 2016	Adoption and impact report prepared, documenting early adoption and impacts of maize-legume technologies and shared with researchers and other stakeholders by September 2016 by CIMMYT and IITA	
	3.3 Trade off analyses for different technologies, per farm type identified	Trade off overview per farm type report available by September 2015 by CIMMYT, IITA and WUR	
Output 4: R4D and Innovation platforms influencing stakeholder practices established	4.1 At least 1 R4D Innovation Platform constituted in all 3 districts of target areas by September 2015 by DACO, CIMMYT, IITA, KIT, ZAR	Platform constitution reports	Supportive environment for implementation of SIMLEZA-AR activities
	4.2 Setting up systematic feedback loops with farmers and document outcomes by September 2015	Document farmer views and feed back into the IP and SIMLEZA-AR	
Research Output 2:integrated systems improvement			
Output 5: Innovations that increase resilience and productivity of farming systems deployed	5.1 On-farm validation trials of maize-legume rotations and integrated innovations established to identify improved germplasm and CA agriculture technologies until September 2016, CIMMYT and TLC	M&E reports, scientific publications, technical and non-technical reports, partner reports, project database	Farmers are willing to provide land for experiments for required period of time
	5.2 On-farm CA and double legume trials established in 3 target districts in November 2014 and 2015 with final analysis results ready by September 2016 - CIMMYT and IIAT		
	5.3 Conduct on-station CA trials (Long term, Double-Up legume and Expanded Step) at Msekera Research Station until September 2016-CIMMYT		

	5.3 On-farm qualitative evaluation of agronomic technologies trials by farmers and other IP stakeholders conducted throughout the 2014/15 and 2015/16 and synthesized by September 2016-CIMMYT		
	5.4 On-station component trials on soybean agronomy, weed management, inoculation, plant population trials conducted throughout the 2014/15 and 2015/16 and synthesized by September 2016 by IITA		
	5.5 Conduct on-farm soybean agronomy trials on inoculation and fertilizer combinations throughout 2014/15 and 2015/16 with a final results ready by September 2016		
	5.6 Conduct on farm and on-station trials to identify stress tolerant and higher yielding maize and legume varieties through farmer- and seed company-participatory evaluation and GXE analysis by September 2016-CIMMYT and IITA		
	5.7 60 pigeon pea demonstration plots established in 7 communities in 2014 and 2015 by IITA		

	5.8 Participatory variety evaluation in the field conducted by farmers in each community as well as by seed companies in seven communities throughout 2015 and 2016- CIMMYT		
Output 6: Crop-nutrition and water efficient innovations introduced, evaluated and adapted	6.1 Best management practices for maize-legume systems identified by September 2016	Report on best practices developed	Farmers are willing to provide land for experiments for required period of time
	6.2 Inventory of improved land and water conservation practices used by farmers per action site at the end of the project phase conducted by September 2016		Weather variables conducive to experimentation
	6.3 Acreage under crop-nutrient and water efficient practices in each action site by end of the project phase by September 2016		
	Acreage of drought tolerant maize varieties increased in target project areas by September 2016		
	6.4 Varietal performance data to accelerate variety release and registration provided to SCCI by September 2015 and 2016	Number of varieties submitted for release to SCCI	New varieties with new traits have been identified
Output 7: Innovations that increase availability and consumption of safe and nutritious food products deployed	7.1 Consumer acceptability/preference of soy bean products developed by September 2015 by IITA	Technical and non-technical reports, partner reports, project database	Farmers are willing to provide land for experiments for required period of time
	7.2 Nutrition education and cooking demonstrations in target groups conducted by September 2015 by IITA		

	7.3 Evaluate nutrient content of traditional products mixed with soy flour		
	7.4 Feasibility studies of introducing soy cow for soy milk production introduced by September 2016		
	7.5 Finalize nutrient database development for data analysis by September 2016 by IITA		
Output 8: Innovations that address emerging agricultural production challenges deployed	8.1 Mitigation technologies and practices used by the farmers (indicator depends on the emerging challenge and innovations deployed).	[same as above]	Technologies to address the emerging issue available at short term
Research Output 3:			
Output 9: Scaling approaches for targeted integrated innovations identified and piloted	9.1 Field days and study tour conducted by September 2015 and 2016	Report on the number of field days, and study tours conducted at each district and camp	Development partners using and adapting Africa RISING technologies and technology scaling approaches
	9.2 Mobilization of farmers using the channels of mass communication (radio, video, TV etc.) and field days to create public awareness of available technologies and help farmers adopt them successfully by September 2016		
	9.3 Develop success stories from each district to document the progress, developments and successes in the project by June 2015 and 2016	Success stories written in SIMLEZA bulletin	
	9.4 Annual evaluation and planning meeting conducted in August annually	Evaluation and planning reports	

9.5 At least one field day organized in each community to create awareness on new maize, and pigeon pea and bring stakeholders together by March 2015 and 2016	Field day reports	Farmers and Seed companies have funds to produce certified seed.
9.6 Identified proven technology components on CA and improved legume agronomy outscaled through "mother-and-baby" extension approaches using the old trials as mothers and small and simplified technology package plots as babies in 2014/15 and 2015/16	Number of small technology demonstration established in 2015 and 2016	
9.7 Maize and legumes seed road maps to enhance the availability of maize and legume seeds and integrate into the work plans of public and private sector partners developed by September 2016	Number of seed companies implementing seed road maps	Farmers and Seed companies have funds to produce certified seed and the weather conditions are favorable
9.8 Increase production and availability of breeder and pre-basic seed of farmer and market preferred maize and legume varieties to stimulate the market and community based seed production and supply	Tons of certified seed produced	
9.9 Functional community based seed production and develop collaborative partnerships with seed companies facilitated by IITA by September 2016		

FEED THE FUTURE INDICATORS

Data Entry Status Report as of 07-Mar-2014 01:28:20 AM, Washington DC Time

Indicator / Disaggregation	Deviation Narrative	Comment	Baseline Year	Baseline Value	2013				2014	2015	
					Target		Actual		Target	Actual	Target
					PPR	Updated					
R&D- SIMLEZA CIMMYT & IITA											
3.1.9(1): Number of people trained in child health and nutrition through USG-supported programs (S)		1		0		360	361		718	444	
Male			2011	0		60	63		306	133	
Female			2011	0		300	298		411	311	
Disaggregates Not Available											
4.5.2(11): Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance (RIA) (WOG)		2		0		2	2		4	5	
Type of organization											
Private enterprises (for profit)											
Producers organizations											

Water users associations										
Women's groups			2011	0		2	2		4	5
Trade and business associations										
Community-based organizations (CBOs)										
Disaggregates Not Available										
New/Continuing										
New			2011	0			0		2	1
Continuing			2011	0		2	2		2	4
Disaggregates Not Available										
4.5.2(12): Number of public-private partnerships formed as a result of FTF assistance (S)		3		0		0	0		1	1
Agricultural production			2011	0		0	0		1	1
Agricultural post harvest transformation										
Nutrition										
Multi-focus										
Other										
Disaggregates Not Available										
4.5.2(13): Number of rural households benefiting directly from USG interventions (S)		4		0		8000	8150	17,000	18,940	20,000
New			2011	0		5,850	6,000	8,850	10,790	1,060
Continuing			2011	0		2,150	2,150	8,150	8,150	18,940
Disaggregates Not Available										
Gendered Household Type										
Adult Female no Adult Male (FNM)			2011	0		2,000	1,467	4,250	3,788	5,000
Adult Male no Adult Female			2011	0		6,000	6,683	12,750	15,152	15,000

(MNF)										
Male and Female Adults (M&F)										
Child No Adults (CNA)										
Disaggregates Not Available										
4.5.2(2): Number of hectares under improved technologies or management practices as a result of USG assistance (RIA) (WOG)	5	6		0		200	1,533	3,000	3,123	5,000
Technology type										
crop genetics			2011	0		100	1,207	2,000	2,011	3,500
pest management										
disease management										
soil-related			2011	0		100	326	1,000	1,111	1,500
irrigation										
water management										
climate mitigation or adaptation										
other										
total w/one or more improved technology			2011	0		200	1,533	3,000	3,123	5,000
Disaggregates Not Available										
New/Continuing										
New			2011	0		100	1,433	1,467	1,690	2,000
Continuing			2011	0		100	100	1,433	1,433	3,000
Disaggregates Not Available										
Sex										
Male			2011	0						
Female			2011	0						
Association-applied										
Disaggregates Not Available										

4.5.2(27): Number of members of producer organizations and community based organizations receiving USG assistance (S)		7		0		346	351		298	302
Type of organization				0		346	351			
Producer organization			2011	0		346	351		298	0
Non-producer-organization CBO									0	0
Disaggregates Not Available									0	0
Sex										
Male			2011	0		185	190		140	157
Female			2011	0		161	161		158	145
Disaggregates Not Available										
4.5.2(39): Number of new technologies or management practices in one of the following phases of development: (Phase I/II/III) (S)		8				120	120	30	35	3
Phase 1 Number of new technologies or management practices under research as a result of USG assistance			2011	0		27	25	84	82	12
Phase 2 Number of new technologies or management practices under field testing as a result of USG assistance			2011	0		38	38		101	73
Phase 3 Number of new technologies or management practices made available for transfer as a result of USG assistance			2011	0		9	7	8	9	4
Disaggregates Not Available										

4.5.2(42): (4.5.2-28) Number of private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) that applied new technologies or management practices as a result of USG assistance (RIA) (WOG)		9		0		7	5	7	7	7
Type of organization										
Private enterprises (for profit)						5	5	5	5	5
Producers organizations										
Water users associations										
Women's groups			2011	0		2	2	2	2	2
Trade and business associations										
Community-based organizations (CBOs)										
Disaggregates Not Available										
New/Continuing										
New			2011	0		4	2	2	0	0
Continuing			2011	0		3	3	5	7	7
Disaggregates Not Available										
4.5.2(5): Number of farmers and others who have applied new technologies or management practices as a result of USG assistance (RIA) (WOG)	10	11		0		8000	8471	18829	15 100	20 000
New/Continuing										
New			2011	0		6,000	6,471	10,358	3,729	4,900
Continuing			2011	0		2,000	2,000	8,471	10,358	15,100
Disaggregates Not Available										
Sex										
Male			2011	0		6,000	6,353	13,180	12,080	14,000

Female			2011	0		2,000	2,118	5,649	3,020	6,000
Disaggregates Not Available										
4.5.2(6): Number of individuals who have received USG supported long-term agricultural sector productivity or food security training (S)		12		0		5	5	5	5	5
Male			2011	0		2	2	2	2	2
Female			2011	0		3	3	3	3	3
Disaggregates Not Available										
4.5.2(7): Number of individuals who have received USG supported short-term agricultural sector productivity or food security training (RIA) (WOG)		13		0		800	2,266	4,525	7,137	10,000
Type of individual										
Producers			2011	0		775	2,229	4,482	7,044	9,863
People in government			2011	0		18	21	28	36	56
People in private sector firms			2011	0		2	3	6	37	51
People in civil society			2011	0		5	5	9	20	30
Disaggregates Not Available									0	0
Sex										
Male			2011	0		560	1,813	3,168	58,852	7,750
Female			2011	0		240	653	1,357	1,285	2,250
Disaggregates Not Available										

